Novel Adsorbents for Trace Mercury Extraction from Water

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ABSTRACT

A new class of adsorbents for the removal of low concentrations of mercury II from water has been developed. They are prepared by physical adsorption of water-insoluble mercury ligands onto macroporous polystyrene resin beads. The novelty of the adsorbents in this study, relative to ones used before, is that the mercury-complexing ligands are not chemically bonded onto the surface of the adsorbent, but are held in place as a result of the similarity of their solubility and polarity properties with those of the support. This difference makes the adsorbents in this study easy to prepare at low cost.
In the initial studies, we have prepared several such adsorbents and using water-insoluble phosphines and thiol ligands for mercury, and have demonstrated their effectiveness for mercury scavenging from water solutions containing low concentrations of mercury. Using 1-octadecanethiol as the mercury ligand on macroporous polystyrene, we have demonstrated quantitative removal of trace mercury concentrations from water solutions, in batch as well as continuous extraction experiments. This poster shows the initial results and the future directions of this study.

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